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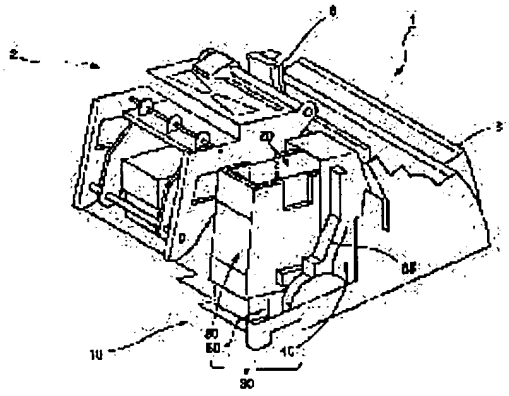
(54) INK CARTRIDGE LOADING MECHANISM FOR PRINTER



(57)Abstract:

PROBLEM TO BE SOLVED: To reduce the space in the direction for loading an ink cartridge.

SOLUTION: When an ink cartridge 20 is loaded to the ink cartridge loading mechanism 10 for a printer, the ink cartridge 20 is pushed into a receiving part 50 vertically from above. The receiving part 50 is then slid horizontally toward the ink supply needle side by operating the operational lever 65 of a slide mechanism 60. Consequently, the ink supply needle is inserted perfectly into the ink take-in port of the ink cartridge 20. Since a large space is not required in the loading direction as compared with a case for loading the ink cartridge from one direction, restriction on the installing position of a printer is relaxed and the installation space can be reduced.

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CLAIMS

[Claim(s)]

[Claim 1] It has the applied part which equips with an ink cartridge removable, and the ink supply needle arranged at this applied part. In the ink cartridge wearing device of a printer in which said applied part is equipped with the ink cartridge concerned so that said ink supply needle may be inserted and connected to the ink output port of an ink cartridge The acceptance section which accepts an ink cartridge from a different direction from the direction of an axis of said ink supply needle, and changes said ink supply needle into the condition in which a plug is possible at said ink output port, The ink cartridge wearing device of the printer characterized by having the sliding mechanism which makes the both-way migration of the acceptance section concerned carry out in the direction of an axis of said ink supply needle.

[Claim 2] It is the ink cartridge wearing device of the printer characterized by being the direction where the direction of an axis of said ink supply needle carries out the abbreviation rectangular cross of the ink cartridge acceptance direction of said acceptance section in claim 1.

[Claim 3] It is the ink cartridge wearing device of the printer characterized by having the device in which rotation of the guide frame to which said sliding mechanism is supporting said acceptance section possible [a slide] in which term of the claims 1 or 2, the control lever formed in the guide frame side concerned free [rotation], and the control lever concerned is changed into the rectilinear motion to which said acceptance section is made to slide.

[Claim 4] It is the ink cartridge wearing device of the printer characterized by having the guide frame to which said sliding mechanism is supporting said acceptance section possible [a slide] in claim 3, the rack formed in said acceptance section side, the pinion which was formed in said guide frame side and has geared on said rack, and the control lever prolonged in radial from the center of rotation of the pinion concerned in order to rotate the pinion concerned.

[Claim 5] It is the ink cartridge wearing device of the printer characterized by having the guide frame to which said sliding mechanism is supporting said acceptance section possible [a slide] in claim 3, the projection formed in said acceptance section side, and the control lever to which it is formed in said guide frame side, engage with said projection, and said acceptance section is made to slide.

[Claim 6] It is the ink cartridge wearing device of the printer characterized by having the guide frame to which said sliding mechanism is supporting said acceptance section possible [a slide] in claim 3, the groove cam formed in said acceptance section side, and the control lever equipped with the projection which is formed in said guide frame side and engages with said cam.

[Claim 7] The ink cartridge with which it is equipped in claim 1 thru/or which term of 6 is the ink cartridge wearing device of the printer characterized by having said ink output port formed in the ink bag and the ink bag concerned of the flexibility with which ink was enclosed, and the

hard case where said ink bag is built in.
[Claim 8] It is the ink cartridge wearing device of the printer characterized by arranging said ink supply needle horizontally in claim 1 thru/or which term of 7.
[Claim 9] The lid which has blocked opening of said acceptance section in the condition that it can open in the acceptance direction of an ink cartridge, in claim 1 thru/or which term of 8, It has the spring which turns this lid in the blockade direction and is energizing it, and the engagement section which holds said lid to the blocked state. Said engagement section The ink cartridge wearing device of the printer characterized by being movable in the direction which engagement cancels by the ink cartridge stuffed into said acceptance section.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the wearing device of the ink cartridge in the printer equipped with the ink jet head.
[0002]
[Description of the Prior Art] If the thing of the format which supplies ink to an ink jet head, using an ink cartridge as a printer equipped with the ink jet head is known and the ink of an ink cartridge is lost, an ink cartridge is exchangeable to a new thing. The wearing device of an ink cartridge is equipped with the ink supply needle arranged in the fixed location, and wearing of an ink cartridge is performed so that this ink supply needle may be inserted in the ink output port of an ink cartridge.
[0003] The thing of a configuration of having been indicated as an ink cartridge by JP,5-16378,A by this application people is known. This ink cartridge consists of ink output port formed in the ink bag and this ink bag of the flexibility with which ink was enclosed, and a hard plastics case where the ink bag was built in. Generally the plastics case is carrying out the flat rectangular parallelepiped configuration, and the ink output port formed in the front end side of this case at the ink bag is exposed. Therefore, wearing of an ink cartridge is performed so that the near ink supply needle of a printer may be inserted in this ink output port.
[0004] In order to insert and fix the ink supply needle of fixed die length to the suitable condition for ink output port, it is necessary to make an ink cartridge turn and slide in the direction of a plug. The attachment and detachment are possible by arranging the applied part of an ink cartridge and making an ink cartridge slide to a before [a printer] side, or the part of the backside horizontally from a before side or the backside generally.
[0005]
[Problem(s) to be Solved by the Invention] However, it is necessary to open widely the part by the side of wearing of the wearing part by the device in which make an ink cartridge slide to an one direction, and it equips with it from a before [a printer] side, or the backside in this way. For this reason, there are the following troubles.
[0006] First, since the printer concerned cannot be installed in the printer equipped with a cartridge in the wall case from a rear face, even if it makes the area of base of the printer itself small, many tooth spaces required for installation will be taken.
[0007] Moreover, by the printer which equipped with the ink cartridge from the front face, the equipment relevant to a printer etc. cannot be put on a front face. For example, by the printer of a

POS application, the display which displays before a printer the data inputted by input devices, such as a tablet, a keyboard, and a scanner, and the input device of ****** may be arranged. For this reason, the printer which equips with an ink cartridge from a front face must move these equipments in the case of ink cartridge exchange, and is not desirable on user-friendliness.
[0008] Thus, the ink cartridge wearing device of the conventional printer has the technical problem which should be solved that constraint moreover needs many installations in connection with the installation of a printer. Then, the technical problem of this invention is to propose the ink cartridge wearing device of the printer which can cancel these.
[0009]
[Means for Solving the Problem] He is trying for a tooth space required for wearing of an ink cartridge to end at least compared with the case where constitute an ink cartridge wearing device so that it may equip with a different direction from it to the ink supply needle arranged in this invention at the ink cartridge applied part of a printer to an ink cartridge and after an appropriate time can be equipped with an ink cartridge towards the direction of an ink supply needle, and it equips with an one direction to an ink cartridge like before by this.
[0010] Namely, the applied part which this invention equips with an ink cartridge removable, In the ink cartridge wearing device of a printer in which said applied part is equipped with the ink cartridge concerned so that it may have the ink supply needle arranged at this applied part and said ink supply needle may be inserted and connected to the ink output port of an ink cartridge The acceptance section which accepts an ink cartridge from a different direction from the direction of an axis of said ink supply needle, and changes said ink supply needle into the condition in which a plug is possible at said ink output port, It is characterized by having the sliding mechanism which makes the both-way migration of the acceptance section concerned carry out in the direction of an axis of said ink supply needle.
[0011] With the gestalt of typical operation of this invention, the ink cartridge acceptance direction of said acceptance section is made into the direction which carries out an abbreviation rectangular cross with the direction of an axis of said ink supply needle. Of course, it is good also as a direction which makes not the direction that intersects perpendicularly but an acute angle, or an obtuse angle.
[0012] The configuration equipped with the device in which rotation of the guide frame currently supported possible [a slide of said acceptance section] as the above-mentioned sliding mechanism, the control lever formed in the guide frame side concerned free [rotation], and the control lever concerned is changed into the rectilinear motion to which said acceptance section is made to slide is employable.
[0013] The configuration equipped with the more concrete for example, guide frame currently supported possible [a slide of said acceptance section], the rack formed in said acceptance section side, the pinion which was formed in said guide frame side and has geared on said rack, and the control lever prolonged in radial from the center of rotation of the pinion concerned in order to rotate the pinion concerned is employable. If the sliding mechanism of this configuration is used, slide actuation of the acceptance section can be easily performed by the small force by lengthening a control lever.
[0014] Besides a rack and the sliding mechanism using a pinion, as mentioned above Moreover, for example, the guide frame currently supported possible [a slide of said acceptance section], The configuration equipped with the projection formed in said acceptance section side, and the control lever to which it is formed in said guide frame side, engage with said projection, and said acceptance section is made to slide, and the groove cam formed in said acceptance section side,

It is formed in said guide frame side, and you may make it make said acceptance section slide using the configuration which has the control lever equipped with the projection which engages with said cam.
[0015] Here, as an ink cartridge with which it is equipped, this application people who mentioned above can use the thing of an indication for JP,5-16378,A proposed previously. This ink cartridge has composition equipped with said ink output port formed in the ink bag and the ink bag concerned of the flexibility with which ink was enclosed, and the hard case where said ink bag is built in.
[0016] When using the ink cartridge of this configuration, it is desirable from the point of reduction-izing of ink leakage to arrange said ink supply needle horizontally.
[0017] In addition, it is desirable to attach a lid in opening of this acceptance section so that a foreign matter may not go into the acceptance section of an ink cartridge applied part in the condition of having removed the ink cartridge. In this case, the spring which considers as the configuration which has blocked opening of said acceptance section in the condition that this lid can be opened in the acceptance direction of an ink cartridge, turns this lid in the blockade direction and is energizing it, The engagement section which holds said lid to the blocked state is attached. Further said engagement section Since what [a thing] movable in the direction which engagement cancels, then attachment-and-detachment actuation of an ink cartridge are interlocked with and said lid opens and closes by the ink cartridge stuffed into said acceptance section, operability becomes good.
[0018]
[Embodiment of the Invention] The configuration of the printer equipped with the ink cartridge wearing device which applied this invention to below with reference to the drawing is explained.
[0019] (The whole printer configuration) Drawing 1 and drawing 2 are the perspective views which looked at the ink jet printer which applied this invention from the slanting front and slanting back, respectively, and drawing 3 is the explanatory view showing the outline of the paper conveyance path.
[0020] If it explains with reference to these drawings, an ink jet printer 1 has the roll-sheet feeder style 2 and the feed openings 3, such as cut sheets, such as A4 size, and slip paper, and the conveyance path is constituted so that the slip paper 5 inserted from the roll sheet 4 and the feed opening 3 which are supplied from the roll-sheet feeder style 2 may be conveyed through the printing position 11 (field surrounded with the alternate long and short dash line in drawing 1). The ink jet head 8 is held according to the carriage device 9 so that face to face may be stood against the front face of the roll sheet 4 which passes through the printing position 11, and the slip paper 5.
[0021] the direction in which the carriage device 9 intersects perpendicularly along with the guide shaft 6 and this guide shaft 6 in the conveyance direction of a roll sheet 4 and the slip paper 5 -- a round trip -- it has the carriage 7 held movable and a motor for a carriage drive (not shown).
[0022] the range where carriage 7 includes the printing position 11 -- the cross direction -- a round trip -- it is movable and capping side 11C of capping device 11B which is the evacuation location of the ink jet head 8 is arranged in the location from which it separated in one crosswise side from the printing position 11. The ink jet head 8 is set as the condition that the nozzle side was closed by capping side 11C, in the condition of standing by printing actuation, and retreat of the ink meniscus of each ink nozzle, ink desiccation, etc. are prevented.
[0023] Ink is supplied to the ink jet head 8 via an ink tube (not shown) from the roll-sheet feeder

style 2 and the ink cartridge wearing device 10 as an ink feed zone carried in the ******** location. The ink cartridge wearing device 10 is equipped with the ink cartridge applied part 30 equipped with the ink cartridge 20 in the removable condition so that drawing 2 may show.
[0024] (An ink supply system and ink cartridge) Here, with reference to drawing 4 (A), the outline of the ink supply system for supplying ink to the ink jet head 8 is explained. The ink supply needle 31 is arranged, and the ink cartridge applied part 30 of the ink cartridge wearing device 10 is equipped with the ink cartridge 20 so that this ink supply needle 31 may be in the condition of having been inserted completely. The ink supplied to the ink supply needle 31 is supplied to the ink jet head 8 through the ink tube 32 from an ink cartridge 20. By driving the ink jet head 8, a liquid ink drop is breathed out from each ink nozzle (not shown) in the record paper which has the printing position 11 conveyed. In the condition that the ink jet head 8 was blocked by capping side 11C of capping device 11B, by driving the ink pump 33, ink can be attracted from a nozzle side and it can collect to the waste ink stripping section 35 via the waste ink tube 34.
[0025] Next, with reference to drawing 4 (B), the outline of the internal structure of an ink cartridge 20 is explained. The ink cartridge 20 has composition equipped with the ink output port 22 formed in the ink bag 21 and the ink bag 21 concerned of the flexibility with which ink was enclosed, and the hard case 23 where the ink bag 21 is built in. A case 23 consists of case body 23a and case lid 23b, and hole 23e 23d of needle plug holes in which a plug is possible, and for three ink cartridge positioning is opening the ink supply needle 31 from the outside to ink output port 22 at the front end side 23c. In addition, the detection plate 24 for detecting an ink residue is attached in the side face of the ink bag 21.
[0026] (Ink cartridge wearing device) Next, the configuration of the ink cartridge wearing device 10 included in the printer 1 is explained.
[0027] Drawing 5 (A) and (B) are drawings showing the condition of the ink cartridge wearing device 10 before equipping with an ink cartridge 20, and drawing 6 (A) and (B) have shown the next condition, before making an ink cartridge 20 slide to the ink supply needle 31 side with a sliding mechanism.
[0028] If it explains with reference to these drawings, the ink cartridge wearing device 10 is equipped with the applied part 30 which equips with an ink cartridge 20 removable. The ink supply needle 31 was horizontally attached in the side face, and this applied part 30 is equipped with the hood 40 from which the tip side of the ink supply needle 31 is in the open condition. From the side face of this hood 40, three gage pins 42 have projected horizontally towards the same direction as the ink supply needle 31. Moreover, the applied part 30 is equipped with the direction 50 of an axis of the ink supply needle 31, i.e., the ink cartridge acceptance section of a cube type which can be slid horizontally, to this hood 40. Furthermore, it has the sliding mechanism 60 for making this acceptance section 50 slide horizontally.
[0029] The bottom serves as opening 51 and the acceptance section 50 of a cube type can equip with an ink cartridge 20 perpendicularly inside the acceptance section 50 concerned from this top opening 51 bottom. That is, an ink cartridge 20 is acceptable from the direction which carries out an abbreviation rectangular cross to the ink supply needle 31. 52d of openings and tooling-holes 52e are open, respectively in the location which is in agreement with 23d of needle holes and three tooling-holes 23e which were opened in the front end side 23 of the ink cartridge 20 with which the front end side 52 of this acceptance section 50 was equipped.
[0030] The lid 53 is attached in the top opening 51 of this acceptance section 50. It can be circled in this lid 53 towards a lower part (the acceptance direction of an ink cartridge) focusing on one

near fixed pivot 53a of the acceptance section 50, and it is always energized in the direction closed according to the spring force. Moreover, after the lid 53 has closed, a tip gets into the engagement slot 54 formed in the side face of the acceptance section 50, and it is in the lock condition. The projection 25 movable in a longitudinal direction is formed in the pars-basilaris-ossis-occipitalis side face of an ink cartridge 20 in the engagement slot 54. Therefore, if an ink cartridge 20 is pushed in from the bottom, the part in which the engagement slot 54 is formed will move elastically, and a lid lock will be canceled by this projection 25. After this, with an ink cartridge 20, a lid 53 circles caudad and will be in the condition of having been pushed against the side face of the acceptance section 50. If an ink cartridge 20 is accepted and it pulls up from the section 50, in connection with it, according to the spring force, a lid 53 will circle up and will return to the lock condition shown in drawing 5 (B) again.

[0031] The sliding mechanism 60 for making this acceptance section 50 slide has the guide frame 61 currently supported possible [a slide of the acceptance section 50], and the rail slot 62 where the guide rail 56 formed along the base of the acceptance section 50 was inserted in this guide frame 61 free [sliding] is formed. The rack 63 is formed downward in the side face of the acceptance section 50 towards the slide direction. On the other hand, the pinion 64 is attached in the condition of having geared on this rack 63, free [rotation] at the guide frame 61 side. In the side face of this pinion 64, the control lever 65 is mostly prolonged in radial from the center line of rotation 66 of a pinion 64.

[0032] (Wearing actuation of an ink cartridge) With reference to drawing 5 and drawing 6 , wearing actuation of the ink cartridge 20 in the ink cartridge wearing device 10 of this example constituted as mentioned above is explained.

[0033] First, in the condition that the ink cartridge acceptance section 50 was pulled out from the hood 40, as shown in drawing 5 (A) and (B), an ink cartridge 20 is stuffed into the top opening 53 from the bottom, as an arrow head shows. Consequently, a lid 53 is pushed, it opens and an ink cartridge 20 will be accepted in the interior. In this condition, hole 23e 23d of needle holes opened in the front end side 23 of an ink cartridge 20 and for three positioning is in agreement with hole 52e 52d of openings opened in the front end side of the acceptance section 50, and for positioning, respectively.

[0034] Thus, the condition of drawing 6 (A) is formed. The control lever 65 in the condition of having fallen horizontally after this is operated in the direction started up. By this actuation, the acceptance section 50 equipped with the ink cartridge 20 is horizontally slid towards the ink supply needle 31 side.

[0035] If a control lever 65 is raised completely, as shown in drawing 6 (B), the front end side 52 of the acceptance section 50 will be in the condition of having hit the side face of a hood 40. While resulting in this condition, from from, since three gage pins 42 are inserted in hole 52e for positioning of an acceptance section front end side, and hole 23e of an ink cartridge front end side, an ink cartridge 20 is guided and they are positioned with these gage pins 42. Moreover, the ink supply needle 31 projected horizontally is also received, 23d of needle holes of 52d of openings of a section front end side and the front end side of an ink cartridge 20 is penetrated, and it is completely inserted in the ink incorporation opening 22 of the interior. Consequently, the ink supply system from the ink cartridge 20 to the ink JIEDDO head 8 is formed.

[0036] What is necessary is on the other hand, just to perform actuation contrary to the above, in exchanging for a new thing the ink cartridge 20 which became empty. That is, it is operated so that the control lever 65 of the condition which shows in drawing 6 (B) may be turned and moved to the backside. Consequently, the acceptance section 50 slides back and that top opening

53 will be completely pulled out from a hood 40. Namely, it will be in the condition of drawing 6 (A). What is necessary is after this, to hold by hand the both-sides side of the ink cartridge 20 exposed from the notching parts 57a and 57b formed in the both-sides side of the acceptance section 50, and just to pull out perpendicularly towards the upper part.

[0037] (Other operation gestalten of an ink cartridge wearing device) Next, other operation gestalten of the ink cartridge wearing device of this invention are explained using drawing 7 .

[0038] Drawing 7 (A) and (B) have shown the next condition, before making an ink cartridge 20 slide to the ink supply needle 31 side with a sliding mechanism. The same sign as the sign shown in drawing 5 and drawing 6 omits explanation among drawing about the same part as the operation gestalt which showed the same thing and was shown by drawing 5 and drawing 6 below.

[0039] Projections 71, 72, and 73 are formed in the side face of the ink cartridge acceptance section 50 of the ink cartridge wearing device of this operation gestalt. When using a center line of rotation 66 as the supporting point, and rotating control-lever 65b, and lever 65b contacts and pushes against these projections 71, 72, and 73, these projections are arranged in the proper place of the side face of the acceptance section 50 so that the ink cartridge acceptance section 50 may slide horizontally.

[0040] In addition, the sliding mechanism 60 of the point that the rail slot 62 where the guide rail 56 formed along the base of the acceptance section 50 was inserted in the point and guide frame 61 which have the guide frame 61 currently supported possible [a slide of the acceptance section 50] free [sliding] is formed for making the acceptance section 50 slide is the same as that of the above-mentioned operation gestalt.

[0041] Wearing actuation of the ink cartridge 20 in the ink cartridge wearing device of this operation gestalt constituted as mentioned above is explained.

[0042] The ink cartridge acceptance section 50 is pulled out from a hood 40, and drawing 7 (A) shows the condition of having been equipped with the ink cartridge 20 from the bottom, and operates it in the direction from which control-lever 65b in the condition of having fallen horizontally after this is started up. By this actuation, the acceptance section 50 equipped with the ink cartridge 20 is horizontally slid towards the ink supply needle 31 side.

[0043] That is, if control-lever 65b is started in the direction of an arrow head, the side face 67 of control-lever 65b will contact projection 71 first. Furthermore, projection 71 will be pushed on the side face 67 of control-lever 65b if control-lever 65b is started. This accepts and the section 50 is slid in the direction of an arrow head along the rail slot 62 in which the guide rail 56 formed along the base was inserted.

[0044] Furthermore, if control-lever 65b is started, ** and projection 72 will be pushed on the side face 68 of the side-face 67 top of control-lever 65b. And if control-lever 65b is started completely, as shown in drawing 7 (B), the front end side 52 of the acceptance section 50 will be in the condition of having hit the side face of a hood 40. In this condition, the ink supply needle 31 projected horizontally penetrates 23d of needle holes of 52d of openings of an acceptance section front end side, and the front end side of an ink cartridge 20, and is completely inserted in the ink incorporation opening 22 of that interior. Consequently, the ink supply system from the ink cartridge 20 to the ink JIEDDO head 8 is formed.

[0045] In addition, three gage pins [from] 42 of the point inserted in hole 52e for positioning of an acceptance section front end side and hole 23e of an ink cartridge front end side are the same as that of the above-mentioned operation gestalt while resulting in this condition.

[0046] On the other hand, when exchanging for a new thing the ink cartridge 20 which became

empty, actuation contrary to the above is performed. That is, it is operated so that control-lever 65b of the condition which shows in drawing 7 (B) may be turned and moved to the backside. Consequently, the projection 73 of the acceptance section 50 is pushed by the side face 69 of the opposite side of the side face 67 of control-lever 65b, and the acceptance section 50 slides back.
[0047] If 65d of control levers is pushed down completely, it will be completely pulled out from a hood 40 by the top opening 53 of the acceptance section 50. Namely, it will be in the condition of drawing 7 (A). What is necessary is after this, to hold by hand the both-sides side of the ink cartridge 20 exposed from the notching parts 57a and 57b formed in the both-sides side of the acceptance section 50, and just to pull out perpendicularly towards the upper part.
[0048] In addition, although this operation gestalt explained the example to which the cartridge acceptance section is made to slide as a projection is prepared in a cartridge acceptance section side and a projection is pushed on by the control lever, not only this but various sliding mechanisms can be used. For example, a projection (cam follower) may be prepared in a control-lever side, the groove cam which engages with this projection may be prepared in a cartridge acceptance section side, and rotation of a control lever may be changed into the rectilinear motion to which said acceptance section is made to slide using the device to which the cartridge acceptance section is made to slide according to rotation of a control lever.
[0049]
[Effect of the Invention] As explained above, in the ink cartridge wearing device of the printer of this invention, wearing of the ink cartridge concerned is completed by equipping with an ink cartridge from a different direction from an ink supply needle, and making an ink cartridge slide to after an appropriate time towards the direction of an ink supply needle. For this reason, like before, compared with the wearing device in which it had equipped with the ink cartridge, there are few tooth spaces of the wearing direction and they end from an one direction.
[0050] Therefore, since the printer equipped with the ink cartridge wearing device of this invention does not need many tooth spaces for a front-face or rear-face side, it does not receive constraint of an installation and, moreover, does so the effectiveness of not needing many installation tooth spaces, either.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the wearing device of the ink cartridge in the printer equipped with the ink jet head.

PRIOR ART

[Description of the Prior Art] If the thing of the format which supplies ink to an ink jet head, using an ink cartridge as a printer equipped with the ink jet head is known and the ink of an ink cartridge is lost, an ink cartridge is exchangeable to a new thing. The wearing device of an ink cartridge is equipped with the ink supply needle arranged in the fixed location, and wearing of an ink cartridge is performed so that this ink supply needle may be inserted in the ink output port of an ink cartridge.
[0003] The thing of a configuration of having been indicated as an ink cartridge by JP,5-16378,A

by this application people is known. This ink cartridge consists of ink output port formed in the ink bag and this ink bag of the flexibility with which ink was enclosed, and a hard plastics case where the ink bag was built in. Generally the plastics case is carrying out the flat rectangular parallelepiped configuration, and the ink output port formed in the front end side of this case at the ink bag is exposed. Therefore, wearing of an ink cartridge is performed so that the near ink supply needle of a printer may be inserted in this ink output port.
[0004] In order to insert and fix the ink supply needle of fixed die length to the suitable condition for ink output port, it is necessary to make an ink cartridge turn and slide in the direction of a plug. The attachment and detachment are possible by arranging the applied part of an ink cartridge and making an ink cartridge slide to a before [a printer] side, or the part of the backside horizontally from a before side or the backside generally.

EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, in the ink cartridge wearing device of the printer of this invention, wearing of the ink cartridge concerned is completed by equipping with an ink cartridge from a different direction from an ink supply needle, and making an ink cartridge slide to after an appropriate time towards the direction of an ink supply needle. For this reason, like before, compared with the wearing device in which it had equipped with the ink cartridge, there are few tooth spaces of the wearing direction and they end from an one direction.
[0050] Therefore, since the printer equipped with the ink cartridge wearing device of this invention does not need many tooth spaces for a front-face or rear-face side, it does not receive constraint of an installation and, moreover, does so the effectiveness of not needing many installation tooth spaces, either.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, it is necessary to open widely the part by the side of wearing of the wearing part by the device in which make an ink cartridge slide to an one direction, and it equips with it from a before [a printer] side, or the backside in this way. For this reason, there are the following troubles.
[0006] First, since the printer concerned cannot be installed in the printer equipped with a cartridge in the wall case from a rear face, even if it makes the area of base of the printer itself small, many tooth spaces required for installation will be taken.
[0007] Moreover, by the printer which equipped with the ink cartridge from the front face, the equipment relevant to a printer etc. cannot be put on a front face. For example, by the printer of a POS application, the display which displays before a printer the data inputted by input devices, such as a tablet, a keyboard, and a scanner, and the input device of ****** may be arranged. For this reason, the printer which equips with an ink cartridge from a front face must move these equipments in the case of ink cartridge exchange, and is not desirable on user-friendliness.
[0008] Thus, the ink cartridge wearing device of the conventional printer has the technical problem which should be solved that constraint moreover needs many installations in connection

with the installation of a printer. Then, the technical problem of this invention is to propose the ink cartridge wearing device of the printer which can cancel these.

MEANS

[Means for Solving the Problem] He is trying for a tooth space required for wearing of an ink cartridge to end at least compared with the case where constitute an ink cartridge wearing device so that it may equip with a different direction from it to the ink supply needle arranged in this invention at the ink cartridge applied part of a printer to an ink cartridge and after an appropriate time can be equipped with an ink cartridge towards the direction of an ink supply needle, and it equips with an one direction to an ink cartridge like before by this.

[0010] Namely, the applied part which this invention equips with an ink cartridge removable, In the ink cartridge wearing device of a printer in which said applied part is equipped with the ink cartridge concerned so that it may have the ink supply needle arranged at this applied part and said ink supply needle may be inserted and connected to the ink output port of an ink cartridge The acceptance section which accepts an ink cartridge from a different direction from the direction of an axis of said ink supply needle, and changes said ink supply needle into the condition in which a plug is possible at said ink output port, It is characterized by having the sliding mechanism which makes the both-way migration of the acceptance section concerned carry out in the direction of an axis of said ink supply needle.

[0011] With the gestalt of typical operation of this invention, the ink cartridge acceptance direction of said acceptance section is made into the direction which carries out an abbreviation rectangular cross with the direction of an axis of said ink supply needle. Of course, it is good also as a direction which makes not the direction that intersects perpendicularly but an acute angle, or an obtuse angle.

[0012] The configuration equipped with the device in which rotation of the guide frame currently supported possible [a slide of said acceptance section] as the above-mentioned sliding mechanism, the control lever formed in the guide frame side concerned free [rotation], and the control lever concerned is changed into the rectilinear motion to which said acceptance section is made to slide is employable.

[0013] The configuration equipped with the more concrete for example, guide frame currently supported possible [a slide of said acceptance section], the rack formed in said acceptance section side, the pinion which was formed in said guide frame side and has geared on said rack, and the control lever prolonged in radial from the center of rotation of the pinion concerned in order to rotate the pinion concerned is employable. If the sliding mechanism of this configuration is used, slide actuation of the acceptance section can be easily performed by the small force by lengthening a control lever.

[0014] Besides a rack and the sliding mechanism using a pinion, as mentioned above Moreover, for example, the guide frame currently supported possible [a slide of said acceptance section], The configuration equipped with the projection formed in said acceptance section side, and the control lever to which it is formed in said guide frame side, engage with said projection, and said acceptance section is made to slide, and the groove cam formed in said acceptance section side, It is formed in said guide frame side, and you may make it make said acceptance section slide using the configuration which has the control lever equipped with the projection which engages with said cam.

[0015] Here, as an ink cartridge with which it is equipped, this application people who mentioned above can use the thing of an indication for JP,5-16378,A proposed previously. This ink cartridge has composition equipped with said ink output port formed in the ink bag and the ink bag concerned of the flexibility with which ink was enclosed, and the hard case where said ink bag is built in.
[0016] When using the ink cartridge of this configuration, it is desirable from the point of reduction-izing of ink leakage to arrange said ink supply needle horizontally.
[0017] In addition, it is desirable to attach a lid in opening of this acceptance section so that a foreign matter may not go into the acceptance section of an ink cartridge applied part in the condition of having removed the ink cartridge. In this case, the spring which considers as the configuration which has blocked opening of said acceptance section in the condition that this lid can be opened in the acceptance direction of an ink cartridge, turns this lid in the blockade direction and is energizing it, The engagement section which holds said lid to the blocked state is attached. Further said engagement section Since what [a thing] movable in the direction which engagement cancels, then attachment-and-detachment actuation of an ink cartridge are interlocked with and said lid opens and closes by the ink cartridge stuffed into said acceptance section, operability becomes good.
[0018]
[Embodiment of the Invention] The configuration of the printer equipped with the ink cartridge wearing device which applied this invention to below with reference to the drawing is explained.
[0019] (The whole printer configuration) Drawing 1 and drawing 2 are the perspective views which looked at the ink jet printer which applied this invention from the slanting front and slanting back, respectively, and drawing 3 is the explanatory view showing the outline of the paper conveyance path.
[0020] If it explains with reference to these drawings, an ink jet printer 1 has the roll-sheet feeder style 2 and the feed openings 3, such as cut sheets, such as A4 size, and slip paper, and the conveyance path is constituted so that the slip paper 5 inserted from the roll sheet 4 and the feed opening 3 which are supplied from the roll-sheet feeder style 2 may be conveyed through the printing position 11 (field surrounded with the alternate long and short dash line in drawing 1). The ink jet head 8 is held according to the carriage device 9 so that face to face may be stood against the front face of the roll sheet 4 which passes through the printing position 11, and the slip paper 5.
[0021] the direction in which the carriage device 9 intersects perpendicularly along with the guide shaft 6 and this guide shaft 6 in the conveyance direction of a roll sheet 4 and the slip paper 5 -- a round trip -- it has the carriage 7 held movable and a motor for a carriage drive (not shown).
[0022] the range where carriage 7 includes the printing position 11 -- the cross direction -- a round trip -- it is movable and capping side 11C of capping device 11B which is the evacuation location of the ink jet head 8 is arranged in the location from which it separated in one crosswise side from the printing position 11. The ink jet head 8 is set as the condition that the nozzle side was closed by capping side 11C, in the condition of standing by printing actuation, and retreat of the ink meniscus of each ink nozzle, ink desiccation, etc. are prevented.
[0023] Ink is supplied to the ink jet head 8 via an ink tube (not shown) from the roll-sheet feeder style 2 and the ink cartridge wearing device 10 as an ink feed zone carried in the ******** location. The ink cartridge wearing device 10 is equipped with the ink cartridge applied part 30 equipped with the ink cartridge 20 in the removable condition so that drawing 2 may show.

[0024] (An ink supply system and ink cartridge) Here, with reference to drawing 4 (A), the outline of the ink supply system for supplying ink to the ink jet head 8 is explained. The ink supply needle 31 is arranged, and the ink cartridge applied part 30 of the ink cartridge wearing device 10 is equipped with the ink cartridge 20 so that this ink supply needle 31 may be in the condition of having been inserted completely. The ink supplied to the ink supply needle 31 is supplied to the ink jet head 8 through the ink tube 32 from an ink cartridge 20. By driving the ink jet head 8, a liquid ink drop is breathed out from each ink nozzle (not shown) in the record paper which has the printing position 11 conveyed. In the condition that the ink jet head 8 was blocked by capping side 11C of capping device 11B, by driving the ink pump 33, ink can be attracted from a nozzle side and it can collect to the waste ink stripping section 35 via the waste ink tube 34.

[0025] Next, with reference to drawing 4 (B), the outline of the internal structure of an ink cartridge 20 is explained. The ink cartridge 20 has composition equipped with the ink output port 22 formed in the ink bag 21 and the ink bag 21 concerned of the flexibility with which ink was enclosed, and the hard case 23 where the ink bag 21 is built in. A case 23 consists of case body 23a and case lid 23b, and hole 23e 23d of needle plug holes in which a plug is possible, and for three ink cartridge positioning is opening the ink supply needle 31 from the outside to ink output port 22 at the front end side 23c. In addition, the detection plate 24 for detecting an ink residue is attached in the side face of the ink bag 21.

[0026] (Ink cartridge wearing device) Next, the configuration of the ink cartridge wearing device 10 included in the printer 1 is explained.

[0027] Drawing 5 (A) and (B) are drawings showing the condition of the ink cartridge wearing device 10 before equipping with an ink cartridge 20, and drawing 6 (A) and (B) have shown the next condition, before making an ink cartridge 20 slide to the ink supply needle 31 side with a sliding mechanism.

[0028] If it explains with reference to these drawings, the ink cartridge wearing device 10 is equipped with the applied part 30 which equips with an ink cartridge 20 removable. The ink supply needle 31 was horizontally attached in the side face, and this applied part 30 is equipped with the hood 40 from which the tip side of the ink supply needle 31 is in the open condition. From the side face of this hood 40, three gage pins 42 have projected horizontally towards the same direction as the ink supply needle 31. Moreover, the applied part 30 is equipped with the direction 50 of an axis of the ink supply needle 31, i.e., the ink cartridge acceptance section of a cube type which can be slid horizontally, to this hood 40. Furthermore, it has the sliding mechanism 60 for making this acceptance section 50 slide horizontally.

[0029] The bottom serves as opening 51 and the acceptance section 50 of a cube type can equip with an ink cartridge 20 perpendicularly inside the acceptance section 50 concerned from this top opening 51 bottom. That is, an ink cartridge 20 is acceptable from the direction which carries out an abbreviation rectangular cross to the ink supply needle 31. 52d of openings and tooling-holes 52e are open, respectively in the location which is in agreement with 23d of needle holes and three tooling-holes 23e which were opened in the front end side 23 of the ink cartridge 20 with which the front end side 52 of this acceptance section 50 was equipped.

[0030] The lid 53 is attached in the top opening 51 of this acceptance section 50. It can be circled in this lid 53 towards a lower part (the acceptance direction of an ink cartridge) focusing on one near fixed pivot 53a of the acceptance section 50, and it is always energized in the direction closed according to the spring force. Moreover, after the lid 53 has closed, a tip gets into the engagement slot 54 formed in the side face of the acceptance section 50, and it is in the lock

condition. The projection 25 movable in a longitudinal direction is formed in the pars-basilaris-ossis-occipitalis side face of an ink cartridge 20 in the engagement slot 54. Therefore, if an ink cartridge 20 is pushed in from the bottom, the part in which the engagement slot 54 is formed will move elastically, and a lid lock will be canceled by this projection 25. After this, with an ink cartridge 20, a lid 53 circles caudad and will be in the condition of having been pushed against the side face of the acceptance section 50. If an ink cartridge 20 is accepted and it pulls up from the section 50, in connection with it, according to the spring force, a lid 53 will circle up and will return to the lock condition shown in drawing 5 (B) again.

[0031] The sliding mechanism 60 for making this acceptance section 50 slide has the guide frame 61 currently supported possible [a slide of the acceptance section 50], and the rail slot 62 where the guide rail 56 formed along the base of the acceptance section 50 was inserted in this guide frame 61 free [sliding] is formed. The rack 63 is formed downward in the side face of the acceptance section 50 towards the slide direction. On the other hand, the pinion 64 is attached in the condition of having geared on this rack 63, free [rotation] at the guide frame 61 side. In the side face of this pinion 64, the control lever 65 is mostly prolonged in radial from the center line of rotation 66 of a pinion 64.

[0032] (Wearing actuation of an ink cartridge) With reference to drawing 5 and drawing 6 , wearing actuation of the ink cartridge 20 in the ink cartridge wearing device 10 of this example constituted as mentioned above is explained.

[0033] First, in the condition that the ink cartridge acceptance section 50 was pulled out from the hood 40, as shown in drawing 5 (A) and (B), an ink cartridge 20 is stuffed into the top opening 53 from the bottom, as an arrow head shows. Consequently, a lid 53 is pushed, it opens and an ink cartridge 20 will be accepted in the interior. In this condition, hole 23e 23d of needle holes opened in the front end side 23 of an ink cartridge 20 and for three positioning is in agreement with hole 52e 52d of openings opened in the front end side of the acceptance section 50, and for positioning, respectively.

[0034] Thus, the condition of drawing 6 (A) is formed. The control lever 65 in the condition of having fallen horizontally after this is operated in the direction started up. By this actuation, the acceptance section 50 equipped with the ink cartridge 20 is horizontally slid towards the ink supply needle 31 side.

[0035] If a control lever 65 is raised completely, as shown in drawing 6 (B), the front end side 52 of the acceptance section 50 will be in the condition of having hit the side face of a hood 40. While resulting in this condition, from from, since three gage pins 42 are inserted in hole 52e for positioning of an acceptance section front end side, and hole 23e of an ink cartridge front end side, an ink cartridge 20 is guided and they are positioned with these gage pins 42. Moreover, the ink supply needle 31 projected horizontally is also received, 23d of needle holes of 52d of openings of a section front end side and the front end side of an ink cartridge 20 is penetrated, and it is completely inserted in the ink incorporation opening 22 of the interior. Consequently, the ink supply system from the ink cartridge 20 to the ink JIEDDO head 8 is formed.

[0036] What is necessary is on the other hand, just to perform actuation contrary to the above, in exchanging for a new thing the ink cartridge 20 which became empty. That is, it is operated so that the control lever 65 of the condition which shows in drawing 6 (B) may be turned and moved to the backside. Consequently, the acceptance section 50 slides back and that top opening 53 will be completely pulled out from a hood 40. Namely, it will be in the condition of drawing 6 (A). What is necessary is after this, to hold by hand the both-sides side of the ink cartridge 20 exposed from the notching parts 57a and 57b formed in the both-sides side of the acceptance

section 50, and just to pull out perpendicularly towards the upper part.
[0037] (Other operation gestalten of an ink cartridge wearing device) Next, other operation gestalten of the ink cartridge wearing device of this invention are explained using drawing 7 .
[0038] Drawing 7 (A) and (B) have shown the next condition, before making an ink cartridge 20 slide to the ink supply needle 31 side with a sliding mechanism. The same sign as the sign shown in drawing 5 and drawing 6 omits explanation among drawing about the same part as the operation gestalt which showed the same thing and was shown by drawing 5 and drawing 6 below.
[0039] Projections 71, 72, and 73 are formed in the side face of the ink cartridge acceptance section 50 of the ink cartridge wearing device of this operation gestalt. When using a center line of rotation 66 as the supporting point, and rotating control-lever 65b, and lever 65b contacts and pushes against these projections 71, 72, and 73, these projections are arranged in the proper place of the side face of the acceptance section 50 so that the ink cartridge acceptance section 50 may slide horizontally.
[0040] In addition, the sliding mechanism 60 of the point that the rail slot 62 where the guide rail 56 formed along the base of the acceptance section 50 was inserted in the point and guide frame 61 which have the guide frame 61 currently supported possible [a slide of the acceptance section 50] free [sliding] is formed for making the acceptance section 50 slide is the same as that of the above-mentioned operation gestalt.
[0041] Wearing actuation of the ink cartridge 20 in the ink cartridge wearing device of this operation gestalt constituted as mentioned above is explained.
[0042] The ink cartridge acceptance section 50 is pulled out from a hood 40, and drawing 7 (A) shows the condition of having been equipped with the ink cartridge 20 from the bottom, and operates it in the direction from which control-lever 65b in the condition of having fallen horizontally after this is started up. By this actuation, the acceptance section 50 equipped with the ink cartridge 20 is horizontally slid towards the ink supply needle 31 side.
[0043] That is, if control-lever 65b is started in the direction of an arrow head, the side face 67 of control-lever 65b will contact projection 71 first. Furthermore, projection 71 will be pushed on the side face 67 of control-lever 65b if control-lever 65b is started. This accepts and the section 50 is slid in the direction of an arrow head along the rail slot 62 in which the guide rail 56 formed along the base was inserted.
[0044] Furthermore, if control-lever 65b is started, ** and projection 72 will be pushed on the side face 68 of the side-face 67 top of control-lever 65b. And if control-lever 65b is started completely, as shown in drawing 7 (B), the front end side 52 of the acceptance section 50 will be in the condition of having hit the side face of a hood 40. In this condition, the ink supply needle 31 projected horizontally penetrates 23d of needle holes of 52d of openings of an acceptance section front end side, and the front end side of an ink cartridge 20, and is completely inserted in the ink incorporation opening 22 of that interior. Consequently, the ink supply system from the ink cartridge 20 to the ink JIEDDO head 8 is formed.
[0045] In addition, three gage pins [from] 42 of the point inserted in hole 52e for positioning of an acceptance section front end side and hole 23e of an ink cartridge front end side are the same as that of the above-mentioned operation gestalt while resulting in this condition.
[0046] On the other hand, when exchanging for a new thing the ink cartridge 20 which became empty, actuation contrary to the above is performed. That is, it is operated so that control-lever 65b of the condition which shows in drawing 7 (B) may be turned and moved to the backside. Consequently, the projection 73 of the acceptance section 50 is pushed by the side face 69 of the

opposite side of the side face 67 of control-lever 65b, and the acceptance section 50 slides back.
[0047] If 65d of control levers is pushed down completely, it will be completely pulled out from a hood 40 by the top opening 53 of the acceptance section 50. Namely, it will be in the condition of drawing 7 (A). What is necessary is after this, to hold by hand the both-sides side of the ink cartridge 20 exposed from the notching parts 57a and 57b formed in the both-sides side of the acceptance section 50, and just to pull out perpendicularly towards the upper part.
[0048] In addition, although this operation gestalt explained the example to which the cartridge acceptance section is made to slide as a projection is prepared in a cartridge acceptance section side and a projection is pushed on by the control lever, not only this but various sliding mechanisms can be used. For example, a projection (cam follower) may be prepared in a control-lever side, the groove cam which engages with this projection may be prepared in a cartridge acceptance section side, and rotation of a control lever may be changed into the rectilinear motion to which said acceptance section is made to slide using the device to which the cartridge acceptance section is made to slide according to rotation of a control lever.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Before the ink jet printer which applied this invention is shown, it is a near perspective view.
[Drawing 2] After the ink jet printer of drawing 1 is shown, it is a near perspective view.
[Drawing 3] It is the explanatory view showing the paper conveyance path in the ink jet printer of drawing 1 .
[Drawing 4] (A) The outline block diagram showing the ink supply system in the ink jet printer of drawing 1 and (B) are the decomposition perspective views showing the configuration of an ink cartridge.
[Drawing 5] The explanatory view in which (A) shows the condition of the ink cartridge wearing device before wearing of an ink cartridge, and (B) are the fragmentary sectional view.
[Drawing 6] It is an explanatory view for explaining wearing actuation of the ink cartridge in an ink cartridge wearing device.
[Drawing 7] It is an explanatory view for explaining wearing actuation of the ink cartridge in other operation gestalten of an ink cartridge wearing device.
[Description of Notations]
1 Ink Jet Printer
2 Roll-Sheet Feeder Style
3 Feed Opening
4 Roll Sheet
6 Guide Shaft
7 Carriage
8 Ink Jet Head
9 Carriage Device
10 Ink Cartridge Wearing Device
11 Printing Position
20 Ink Cartridge
23d Plug hole of an ink supply needle

23e The hole for positioning
25 Projection
30 Ink Cartridge Applied Part
31 Ink Supply Needle
40 Hood
42 Gage Pin
50 Ink Cartridge Acceptance Section
51 Top Opening
52d Opening of an ink supply needle
52e The hole for positioning
53 Lid
54 Engagement Slot
56 Guide Rail
60 Sliding Mechanism
61 Guide Frame
62 Rail Slot
63 Rack
64 Pinion
65 Control Lever

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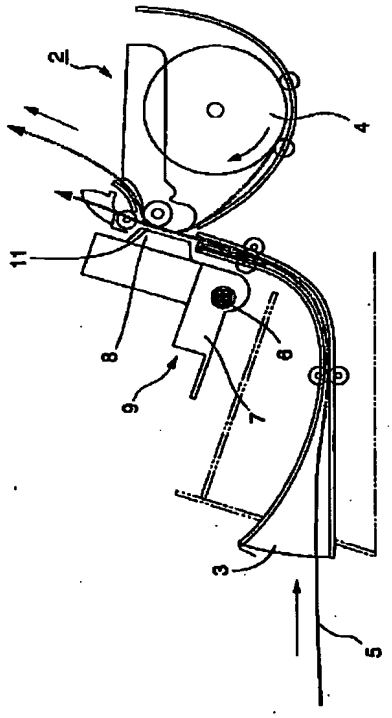
最終頁に続く

(54)【発明の名称】　プリンタのインクカートリッジ装着機構

(57)【要約】

【課題】　インクカートリッジ装着方向のスペースが少なくて済むプリンタのインクカートリッジ装着機構を提案すること。

【解決手段】　プリンタのインクカートリッジ装着機構１０にインクカートリッジ２０を装着するためには、まず、受け入れ部５０に上側から垂直にインクカートリッジ２０を押し込む。次に、スライド機構６０の操作レバー６５を操作して、受け入れ部５０をインク供給針３１の側に向けて水平にスライドさせる。この結果、インク供給針３１がインクカートリッジ２０のインク取り込み口に完全に差し込まれた装着状態が形成される。一方向からインクカートリッジを装着する場合のように装着方向に多くのスペースを開けておく必要が無い。よって、プリンタの設置場所に制約が少なくなり、しかも、その設置スペースも少なくできる。



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【特許請求の範囲】

【請求項１】　インクカートリッジを着脱可能に装着する装着部と、この装着部に配置されたインク供給針とを備え、インクカートリッジのインク取り出し口に前記インク供給針が差し込み接続されるように当該インクカートリッジを前記装着部に装着するプリンタのインクカートリッジ装着機構において、

前記インク供給針の軸線方向とは異なる方向からインクカートリッジを受け入れて前記インク取り出し口に前記インク供給針を差し込み可能な状態にする受け入れ部と、当該受け入れ部を前記インク供給針の軸線方向に往復移動させるスライド機構とを有することを特徴とするプリンタのインクカートリッジ装着機構。

【請求項２】　請求項１において、前記受け入れ部のインクカートリッジ受け入れ方向は前記インク供給針の軸線方向とは略直交する方向であることを特徴とするプリンタのインクカートリッジ装着機構。

【請求項３】　請求項１または２のうちの何れかの項において、前記スライド機構は、前記受け入れ部をスライド可能に支持しているガイドフレームと、当該ガイドフレームの側に回動自在に形成された操作レバーと、当該操作レバーの回転運動を前記受け入れ部をスライドさせる直線運動に変換する機構を備えたことを特徴とするプリンタのインクカートリッジ装着機構。

【請求項４】　請求項３において、前記スライド機構は、前記受け入れ部をスライド可能に支持しているガイドフレームと、前記受け入れ部の側に形成したラックと、前記ガイドフレームの側に形成され前記ラックにかみ合っているピニオンと、当該ピニオンを回転させるために当該ピニオンの回転中心から半径方向に延びている操作レバーとを備えていることを特徴とするプリンタのインクカートリッジ装着機構。

【請求項５】　請求項３において、前記スライド機構は、前記受け入れ部をスライド可能に支持しているガイドフレームと、前記受け入れ部の側に形成された突起と、前記ガイドフレームの側に形成され、前記突起と係合し、前記受け入れ部をスライドさせる操作レバーとを備えていることを特徴とするプリンタのインクカートリッジ装着機構。

【請求項６】　請求項３において、前記スライド機構は、前記受け入れ部をスライド可能に支持しているガイドフレームと、前記受け入れ部の側に形成された溝状のカムと、前記ガイドフレームの側に形成され、前記カムと係合する突起を備えた操作レバーとを有していることを特徴とするプリンタのインクカートリッジ装着機構。

【請求項７】　請求項１ないし６のうちの何れかの項において、装着されるインクカートリッジは、インクが封入された可撓性のインク袋と、当該インク袋に形成した前記インク取り出し口と、前記インク袋が内蔵されている硬質のケースとを備えていることを特徴とするプリンタのインクカートリッジ装着機構。

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【請求項８】　請求項１ないし７のうちの何れかの項において、前記インク供給針は水平に配置されていることを特徴とするプリンタのインクカートリッジ装着機構。

【請求項９】　請求項１ないし８のうちの何れかの項において、インクカートリッジの受け入れ方向に開けることのできる状態で前記受け入れ部の開口を封鎖している蓋と、この蓋を封鎖方向に向けて付勢しているばねと、前記蓋を封鎖状態に保持している係合部とを備えており、前記係合部は、前記受け入れ部に押し込まれるインクカートリッジによって係合が解除する方向に移動可能となっていることを特徴とするプリンタのインクカートリッジ装着機構。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、インクジェットヘッドを備えたプリンタにおけるインクカートリッジの装着機構に関するものである。

【０００２】

【従来の技術】インクジェットヘッドを備えたプリンタとしては、インクカートリッジを用いてインクジェットヘッドにインクの供給を行う形式のものが知られており、インクカートリッジのインクが無くなると、インクカートリッジは新しいものに交換可能となっている。インクカートリッジの装着機構は、固定した位置に配置したインク供給針を備えており、このインク供給針がインクカートリッジのインク取り出し口に差し込まれるように、インクカートリッジの装着が行われる。

【０００３】インクカートリッジとしては、本願人による特開平５－１６３７８号公報に開示された構成のものが知られている。このインクカートリッジは、インクが封入された可撓性のインク袋と、このインク袋に形成したインク取り出し口と、インク袋が内蔵された硬質のプラスチックケースから構成されている。一般的にはプラスチックケースは偏平な直方体形状をしており、このケースの前端面にインク袋に形成したインク取り出し口が露出している。従って、このインク取り出し口に、プリンタの側のインク供給針が差し込まれるように、インクカートリッジの装着が行われる。

【０００４】一定の長さのインク供給針がインク取り出し口に適切な状態に差し込み固定されるようにするためには、インクカートリッジを差し込み方向に向けてスライドさせる必要がある。一般的には、プリンタの前側あるいは後ろ側の部分に、インクカートリッジの装着部が配置されており、インクカートリッジを前側あるいは後ろ側から水平にスライドさせることにより、その着脱が可能となっている。

【０００５】

【発明が解決しようとする課題】しかしながら、このように、プリンタの前側あるいは後ろ側からインクカート

リッジを一方向にスライドさせて装着する機構では、その装着部分の装着側の部分を広く開けておく必要がある。このために次のような問題点がある。

【０００６】まず、後面からカートリッジを装着するようにしたプリンタにおいては、当該プリンタを壁際に設置することができないので、プリンタ自体の底面積を小さくしたとしても設置に必要なスペースを多く取られてしまう。

【０００７】また、前面からインクカートリッジを装着するようにしたプリンタでは、前面にプリンタに関連する装置等を置くことができない。例えば、ＰＯＳ用途のプリンタでは、プリンタの手前に、タブレット、キーボード、スキャナ等の入力装置や、こられの入力装置によって入力されたデータ等を表示する表示装置が配置されることがある。このため、前面からインクカートリッジを装着するプリンタは、インクカートリッジ交換の際にこれらの装置を移動せねばならず、使い勝手上好ましくない。

【０００８】このように、従来のプリンタのインクカートリッジ装着機構は、プリンタの設置場所に制約が伴い、しかも、設置場所を多く必要とするという解決すべき課題がある。そこで、本発明の課題は、これらを解消可能なプリンタのインクカートリッジ装着機構を提案することにある。

【０００９】

【課題を解決するための手段】本発明では、プリンタのインクカートリッジ装着部に配置されているインク供給針に対して、それとは異なる方向からインクカートリッジを装着し、しかる後に、インク供給針の方向に向けてインクカートリッジを装着できるようにインクカートリッジ装着機構を構成し、これによって、従来のように一方向からインクカートリッジを装着する場合に比べて、インクカートリッジの装着のために必要なスペースが少なくても済むようにしている。

【００１０】すなわち、本発明は、インクカートリッジを着脱可能に装着する装着部と、この装着部に配置されたインク供給針とを備え、インクカートリッジのインク取り出し口に前記インク供給針が差し込み接続されるように当該インクカートリッジを前記装着部に装着するプリンタのインクカートリッジ装着機構において、前記インク供給針の軸線方向とは異なる方向からインクカートリッジを受け入れて前記インク取り出し口に前記インク供給針を差し込み可能な状態にする受け入れ部と、当該受け入れ部を前記インク供給針の軸線方向に往復移動させるスライド機構とを有することを特徴としている。

【００１１】典型的な本発明の実施の形態では、前記受け入れ部のインクカートリッジ受け入れ方向は前記インク供給針の軸線方向とは略直交する方向とされる。勿論、直交する方向ではなく、鋭角、あるいは鈍角をなす方向としてもよい。

【００１２】上記のスライド機構としては、前記受け入れ部をスライド可能に支持しているガイドフレームと、当該ガイドフレームの側に回動自在に形成された操作レバーと、当該操作レバーの回転運動を前記受け入れ部をスライドさせる直線運動に変換する機構を備えた構成を採用できる。

【００１３】より具体的には、例えば、前記受け入れ部をスライド可能に支持しているガイドフレームと、前記受け入れ部の側に形成したラックと、前記ガイドフレームの側に形成され前記ラックにかみ合っているピニオンと、当該ピニオンを回転させるために当該ピニオンの回転中心から半径方向に延びている操作レバーとを備えた構成を採用できる。この構成のスライド機構を用いれば、操作レバーを長くすることにより、受け入れ部のスライド操作を小さな力で簡単に行うことができる。

【００１４】また、上記のようにラックとピニオンを用いたスライド機構の他に、例えば、前記受け入れ部をスライド可能に支持しているガイドフレームと、前記受け入れ部の側に形成された突起と、前記ガイドフレームの側に形成され、前記突起と係合し、前記受け入れ部をスライドさせる操作レバーとを備えた構成や、前記受け入れ部の側に形成された溝状のカムと、前記ガイドフレームの側に形成され、前記カムと係合する突起を備えた操作レバーとを有する構成を用いて、前記受け入れ部をスライドさせるようにしてもよい。

【００１５】ここで、装着されるインクカートリッジとしては、前述した本願人が先に提案している特開平５－１６３７８号公報に開示のものを用いることができる。このインクカートリッジは、インクが封入された可撓性のインク袋と、当該インク袋に形成した前記インク取り出し口と、前記インク袋が内蔵されている硬質のケースとを備えた構成となっている。

【００１６】この構成のインクカートリッジを用いる場合には、前記インク供給針を水平に配置することがインク漏れの低減化の点から望ましい。

【００１７】なお、インクカートリッジを取り外した状態においてインクカートリッジ装着部の受け入れ部に異物が入らないように、この受け入れ部の開口に蓋を取付けることが望ましい。この場合、この蓋を、インクカートリッジの受け入れ方向に開けることのできる状態で前記受け入れ部の開口を封鎖している構成とし、この蓋を封鎖方向に向けて付勢しているばねと、前記蓋を封鎖状態に保持している係合部とを取付け、更に、前記係合部は、前記受け入れ部に押し込まれるインクカートリッジによって係合が解除する方向に移動可能となものとすれば、インクカートリッジの着脱動作に連動して前記蓋が開閉するので操作性が良くなる。

【００１８】

【発明の実施の形態】以下に、図面を参照して本発明を適用したインクカートリッジ装着機構を備えたプリンタ

の構成を説明する。

【００１９】（プリンタの全体構成）図１および図２は、それぞれ、本発明を適用したインクジェットプリンタを斜め前方および斜め後方から見た斜視図であり、図３はその紙搬送経路の概要を示す説明図である。

【００２０】これらの図を参照して説明すると、インクジェットプリンタ１は、ロール紙装填機構２と、Ａ４サイズ等のカット紙、スリップ紙等の給紙口３とを有し、ロール紙装填機構２から供給されるロール紙４および給紙口３から挿入されるスリップ紙５が、印刷位置１１（図１における一点鎖線で囲まれた領域）を通って搬送されるように搬送経路が構成されている。印刷位置１１を通過するロール紙４およびスリップ紙５の表面に対峙するようにインクジェットヘッド８がキャリッジ機構９によって保持されている。

【００２１】キャリッジ機構９は、ガイドシャフト６と、このガイドシャフト６に沿ってロール紙４、スリップ紙５の搬送方向とは直交する方向に往復移動可能に保持されたキャリッジ７と、キャリッジ駆動用のモータ（図示せず）を備えている。

【００２２】キャリッジ７は、印刷位置１１を包含する範囲を、その幅方向に往復移動可能であり、印刷位置１１から幅方向の一方の側に外れた位置には、インクジェットヘッド８の退避位置であるキャッピング機構１１Ｂのキャッピング面１１Ｃが配置されている。インクジェットヘッド８は、印字動作を待機する状態では、そのノズル面がキャッピング面１１Ｃによって塞がれた状態に設定されて、各インクノズルのインクメニスカスの後退、インク乾燥等が防止される。

【００２３】インクジェットヘッド８には、インクチューブ（図示せず）を経由して、ロール紙装填機構２と隣合った位置に搭載されているインク供給部としてのインクカートリッジ装着機構１０からインクが供給される。インクカートリッジ装着機構１０は、図２から分かるように、インクカートリッジ２０が着脱可能な状態で装着されたインクカートリッジ装着部３０を備えている。

【００２４】（インク供給系およびインクカートリッジ）ここで、図４（Ａ）を参照して、インクジェットヘッド８にインクを供給するためのインク供給系の概要を説明する。インクカートリッジ装着機構１０のインクカートリッジ装着部３０には、インク供給針３１が配置されており、このインク供給針３１が完全に差し込まれた状態となるように、インクカートリッジ２０が装着されている。インクカートリッジ２０からインク供給針３１に供給されたインクは、インクチューブ３２を経て、インクジェットヘッド８に供給される。インクジェットヘッド８を駆動することにより、各インクノズル（図示せず）からインク液滴が、印刷位置１１を搬送される記録紙上に吐出される。インクジェットヘッド８がキャッピング機構１１Ｂのキャッピング面１１Ｃで封鎖された状態においては、インクポンプ３３を駆動することにより、ノズル面からインクを吸引して廃インクチューブ３４を経由して、廃インク回収部３５に回収可能となっている。

【００２５】次に、図４（Ｂ）を参照して、インクカートリッジ２０の内部構造の概略を説明する。インクカートリッジ２０は、インクが封入された可撓性のインク袋２１と、当該インク袋２１に形成したインク取り出し口２２と、インク袋２１が内蔵されている硬質のケース２３とを備えた構成となっている。ケース２３は、ケース本体２３ａと、ケース蓋２３ｂから構成され、その前端面２３ｃには、外側からインク供給針３１をインク取り出し口２２に差し込み可能な針差し込み孔２３ｄと、３個のインクカートリッジ位置決め用の孔２３ｅが開いてる。なお、インク袋２１の側面には、インク残量を検出するための検出板２４が取付けられている。

【００２６】（インクカートリッジ装着機構）次に、プリンタ１に組み込まれているインクカートリッジ装着機構１０の構成を説明する。

【００２７】図５（Ａ）、（Ｂ）は、インクカートリッジ２０を装着する前のインクカートリッジ装着機構１０の状態を示す図であり、図６（Ａ）、（Ｂ）はスライド機構によってインクカートリッジ２０をインク供給針３１の側にスライドさせる前および後の状態を示してある。

【００２８】これらの図を参照して説明すると、インクカートリッジ装着機構１０は、インクカートリッジ２０を着脱可能に装着する装着部３０を備えている。この装着部３０は、側面にインク供給針３１が水平に取付けられ、インク供給針３１の先端側が開放状態となっているフード部４０を備えている。このフード部４０の側面からは、３本の位置決めピン４２がインク供給針３１と同一方向に向けて水平に突出している。また、装着部３０は、このフード部４０に対して、インク供給針３１の軸線方向、すなわち水平方向にスライド可能な箱形のインクカートリッジ受け入れ部５０を備えている。さらに、この受け入れ部５０を水平方向にスライドさせるためのスライド機構６０を備えている。

【００２９】箱形の受け入れ部５０は上側が開口５１となっており、この上側開口５１の上側から垂直方向にインクカートリッジ２０を当該受け入れ部５０の内部に装着可能となっている。すなわち、インク供給針３１に対して略直交する方向からインクカートリッジ２０を受け入れ可能となっている。この受け入れ部５０の前端面５２には、装着されたインクカートリッジ２０の前端面２３に開けた針孔２３ｄおよび３個の位置決め孔２３ｅに一致する位置に、それぞれ開口５２ｄ、および位置決め孔５２ｅが開いている。

【００３０】この受け入れ部５０の上側開口５１には蓋５３が取付けられている。この蓋５３は、受け入れ部５

０の一方の側の旋回軸５３ａを中心にして下方（インクカートリッジの受け入れ方向）に向けて旋回可能であり、常時は、ばね力によって閉じる方向に付勢されている。また、蓋５３が閉じた状態では、受け入れ部５０の側面に形成した係合溝５４に先端が嵌まってロック状態となっている。インクカートリッジ２０の底部側面には、係合溝５４を横方向に移動可能な突起２５が形成されている。従って、インクカートリッジ２０を上側から押し込むと、この突起２５によって係合溝５４が形成されている部分が弾性的に移動して蓋ロックが解除される。この後は、インクカートリッジ２０と共に蓋５３は下方に旋回し、受け入れ部５０の側面に押しつけられた状態となる。インクカートリッジ２０を受け入れ部５０から引き上げると、それに伴ってばね力によって蓋５３は上方に旋回して、再び、図５（Ｂ）に示すロック状態に復帰する。

【００３１】この受け入れ部５０をスライドさせるためのスライド機構６０は、受け入れ部５０をスライド可能に支持しているガイドフレーム６１を有し、このガイドフレーム６１には、受け入れ部５０の底面に沿って形成したガイドレール５６が摺動自在にはめ込まれたレール溝６２が形成されている。受け入れ部５０の側面には、スライド方向に向けてラック６３が下向きに形成されている。これに対して、ガイドフレーム６１の側には、このラック６３にかみ合った状態にピニオン６４が回転自在に取付けられている。このピニオン６４の側面には操作レバー６５がピニオン６４の旋回中心６６からほぼ半径方向に延びている。

【００３２】（インクカートリッジの装着動作）図５および図６を参照して、上記のように構成した本例のインクカートリッジ装着機構１０におけるインクカートリッジ２０の装着動作について説明する。

【００３３】まず、図５（Ａ）、（Ｂ）に示すように、インクカートリッジ受け入れ部５０がフード部４０から引き出された状態において、上側からインクカートリッジ２０を矢印で示すように、その上側開口５３に押し込む。この結果、蓋５３が押されて開き、内部にインクカートリッジ２０が受け入れられた状態になる。この状態では、インクカートリッジ２０の前端面２３に開けた針孔２３ｄ、および３個の位置決め用の孔２３ｅが、それぞれ、受け入れ部５０の前端面に開けた開口５２ｄ、位置決め用の孔５２ｅに一致している。

【００３４】このようにして図６（Ａ）の状態が形成される。この後は、横に倒れた状態の操作レバー６５を上方に起こす方向に操作する。この操作によって、インクカートリッジ２０が装着された受け入れ部５０はインク供給針３１の側に向けて水平方向にスライドする。

【００３５】操作レバー６５を完全に起こすと、図６（Ｂ）に示すように、受け入れ部５０の前端面５２がフード部４０の側面に当たった状態となる。この状態に到る途中からは、３本の位置決めピン４２が、受け入れ部前端面の位置決め用の孔５２ｅおよびインクカートリッジ前端面の孔２３ｅに差し込まれるので、これらの位置決めピン４２によってインクカートリッジ２０が案内されて位置決めされる。また、水平に突き出しているインク供給針３１も受け入れ部前端面の開口５２ｄおよびインクカートリッジ２０の前端面の針孔２３ｄを貫通して、その内部のインク取り込み口２２に完全に差し込まれる。この結果、インクカートリッジ２０からインクジェッドヘッド８へのインク供給系が形成される。

【００３６】一方、空になったインクカートリッジ２０を新しいものに交換する場合には、上記とは逆の操作を行えばよい。すなわち、図６（Ｂ）に示す状態の操作レバー６５を後ろ側に向けて倒すように操作する。この結果、受け入れ部５０が後方にスライドして、その上側開口５３がフード部４０から完全に引き出された状態になる。すなわち、図６（Ａ）の状態となる。この後は、受け入れ部５０の両側面に形成した切り欠き部分５７ａ、５７ｂから露出しているインクカートリッジ２０の両側面を手で掴み、上方に向けて垂直に引き出せばよい。

【００３７】（インクカートリッジ装着機構の他の実施形態）次に、図７を用いて本発明のインクカートリッジ装着機構の他の実施形態について説明する。

【００３８】図７（Ａ）、（Ｂ）は、スライド機構によってインクカートリッジ２０をインク供給針３１の側にスライドさせる前および後の状態を示してある。図中、図５、図６に示す符号と同一の符号は同じものを示し、以下図５、図６で示した実施形態と同様な部分については説明を省略する。

【００３９】本実施形態のインクカートリッジ装着機構のインクカートリッジ受け入れ部５０の側面には、突起７１、７２、７３が設けられている。旋回中心６６を支点にして、操作レバー６５ｂを回動させたときに、レバー６５ｂがこれらの突起７１、７２、７３に当接し、押しつけることによりインクカートリッジ受け入れ部５０が水平方向にスライドするように、これらの突起は受け入れ部５０の側面の適所に配置されている。

【００４０】なお、受け入れ部５０をスライドさせるためのスライド機構６０は、受け入れ部５０をスライド可能に支持しているガイドフレーム６１を有する点、ガイドフレーム６１には、受け入れ部５０の底面に沿って形成したガイドレール５６が摺動自在にはめ込まれたレール溝６２が形成されている点は前述の実施形態と同様である。

【００４１】上記のように構成した本実施形態のインクカートリッジ装着機構におけるインクカートリッジ２０の装着動作について説明する。

【００４２】図７（Ａ）は、インクカートリッジ受け入れ部５０がフード部４０から引き出され、上側からインクカートリッジ２０が装着された状態を示すものであ

り、この後は、横に倒れた状態の操作レバー６５ｂを上方に起こす方向に操作する。この操作によって、インクカートリッジ２０が装着された受け入れ部５０はインク供給針３１の側に向けて水平方向にスライドする。

【００４３】即ち、操作レバー６５ｂを矢印方向に起こすと、まず操作レバー６５ｂの側面６７が突起７１に当接する。更に操作レバー６５ｂを起こすと、突起７１が操作レバー６５ｂの側面６７に押される。これにより受け入れ部５０は、その底面に沿って形成したガイドレール５６がはめ込まれたレール溝６２に沿って矢印方向にスライドする。

【００４４】また、更に操作レバー６５ｂを起こすと、操作レバー６５ｂの側面６７の上側の側面６８にり、突起７２が押される。そして、操作レバー６５ｂを完全に起こすと、図７（Ｂ）に示すように、受け入れ部５０の前端面５２がフード部４０の側面に当たった状態となる。この状態で、水平に突き出しているインク供給針３１は受け入れ部前端面の開口５２ｄおよびインクカートリッジ２０の前端面の針孔２３ｄを貫通して、その内部のインク取り込み口２２に完全に差し込まれる。この結果、インクカートリッジ２０からインクジェッドヘッド８へのインク供給系が形成される。

【００４５】なお、この状態に到る途中からは、３本の位置決めピン４２が、受け入れ部前端面の位置決め用の孔５２ｅおよびインクカートリッジ前端面の孔２３ｅに差し込まれる点は、前述の実施形態と同様である。

【００４６】一方、空になったインクカートリッジ２０を新しいものに交換する場合には、上記とは逆の操作が行われる。すなわち、図７（Ｂ）に示す状態の操作レバー６５ｂを後ろ側に向けて倒すように操作する。この結果、操作レバー６５ｂの側面６７の反対側の側面６９により、受け入れ部５０の突起７３が押され、受け入れ部５０が後方にスライドする。

【００４７】操作レバー６５ｄを完全に倒すと、受け入れ部５０の上側開口５３がフード部４０から完全に引き出された状態になる。すなわち、図７（Ａ）の状態となる。この後は、受け入れ部５０の両側面に形成した切り欠き部分５７ａ、５７ｂから露出しているインクカートリッジ２０の両側面を手で掴み、上方に向けて垂直に引き出せばよい。

【００４８】なお、本実施形態では、カートリッジ受け入れ部側に突起を設け、操作レバーで突起を押すようにしてカートリッジ受け入れ部をスライドさせる例について説明したが、これに限らず、種々のスライド機構を用いることができる。例えば、操作レバー側に突起（カムフォロア）を設け、カートリッジ受け入れ部側には、この突起と係合する溝状のカムを設け、操作レバーの回転に応じてカートリッジ受け入れ部をスライドさせる機構を用いて、操作レバーの回転運動を前記受け入れ部をスライドさせる直線運動に変換してもよい。

【００４９】

【発明の効果】以上説明したように、本発明のプリンタのインクカートリッジ装着機構においては、インク供給針とは異なる方向からインクカートリッジを装着し、しかる後にインク供給針の方向に向けてインクカートリッジをスライドさせることにより、当該インクカートリッジの装着が完了する。このため、従来のように、一方向からインクカートリッジを装着していた装着機構に比べて、装着方向のスペースが少なくて済む。

【００５０】従って、本発明のインクカートリッジ装着機構を備えたプリンタは、その前面あるいは後面の側にスペースを多く必要としないので、設置場所の制約を受けることがなく、しかも、設置スペースも多く必要としないという効果を奏する。

【図面の簡単な説明】

【図１】本発明を適用したインクジェトプリンタを示す前側の斜視図である。

【図２】図１のインクジェトプリンタを示す後側の斜視図である。

【図３】図１のインクジェットプリンタにおける紙搬送経路を示す説明図である。

【図４】（Ａ）は　図１のインクジェットプリンタにおけるインク供給系を示す概略構成図、（Ｂ）はインクカートリッジの構成を示す分解斜視図である。

【図５】（Ａ）はインクカートリッジの装着前のインクカートリッジ装着機構の状態を示す説明図、（Ｂ）はその部分断面図である。

【図６】インクカートリッジ装着機構におけるインクカートリッジの装着動作を説明するための説明図である。

【図７】インクカートリッジ装着機構の他の実施形態におけるインクカートリッジの装着動作を説明するための説明図である。

【符号の説明】

１　インクジェットプリンタ
２　ロール紙装填機構
３　給紙口
４　ロール紙
６　ガイドシャフト
７　キャリッジ
８　インクジェットヘッド
９　キャリッジ機構
１０　インクカートリッジ装着機構
１１　印刷位置
２０　インクカートリッジ
２３ｄ　インク供給針の差し込み孔
２３ｅ　位置決め用の孔
２５　突起
３０　インクカートリッジ装着部
３１　インク供給針
４０　フード部

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４２　位置決めピン
５０　インクカートリッジ受け入れ部
５１　上側開口
５２ｄ　インク供給針の開口
５２ｅ　位置決め用の孔
５３　蓋
５４　係合溝

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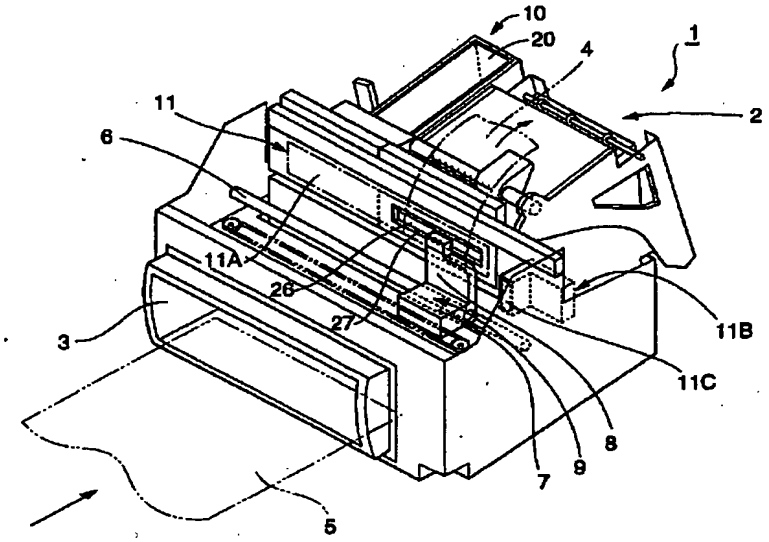
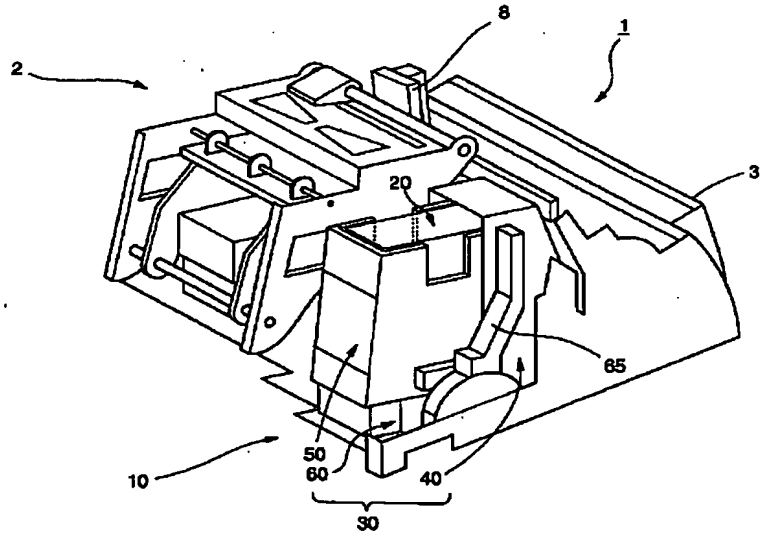
５６　ガイドレール
６０　スライド機構
６１　ガイドフレーム
６２　レール溝
６３　ラック
６４　ピニオン
６５　操作レバー

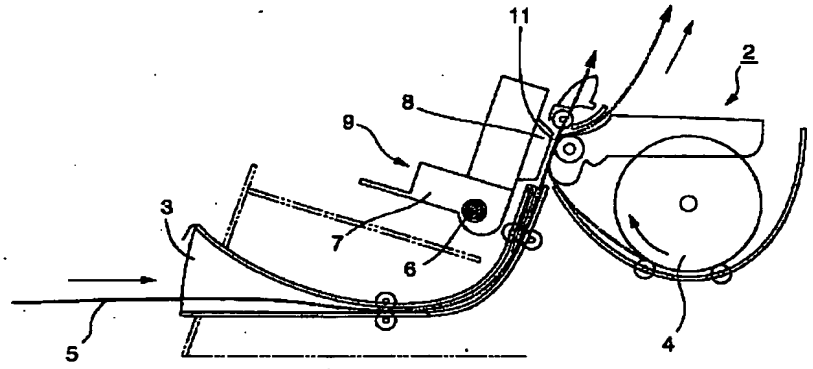
【図１】



【図２】



【図３】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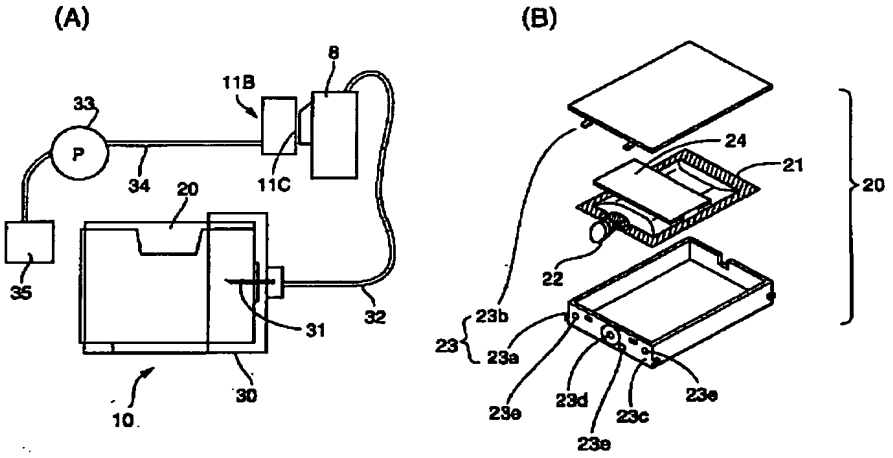
【図４】


(A)
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11B
33
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11C
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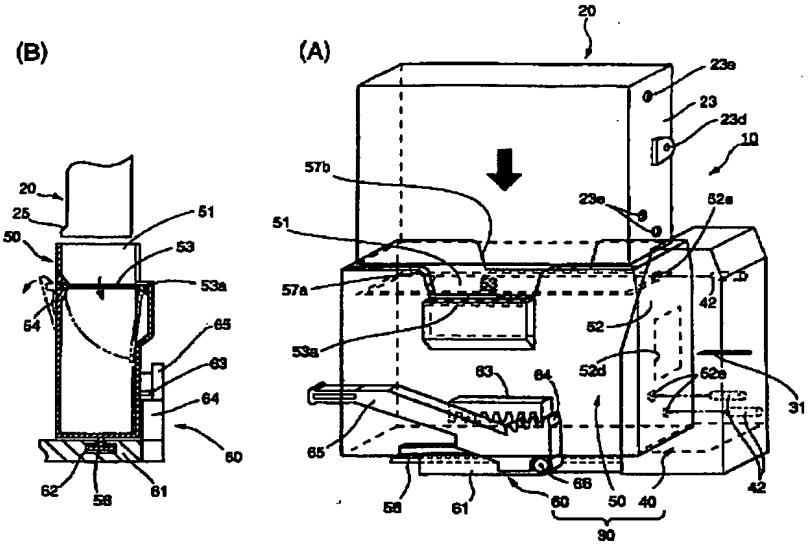
23a
23e
23d
23c
23e

【図５】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23d
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57b
51
57a
53a
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52d
52a
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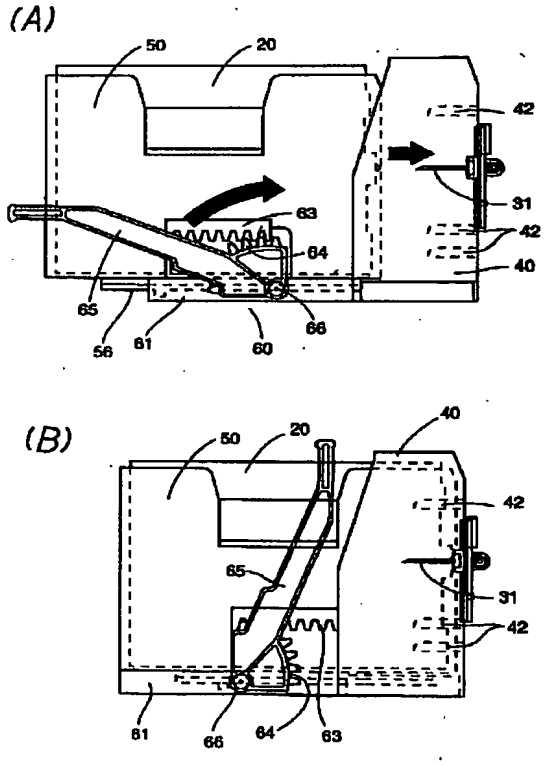
【図６】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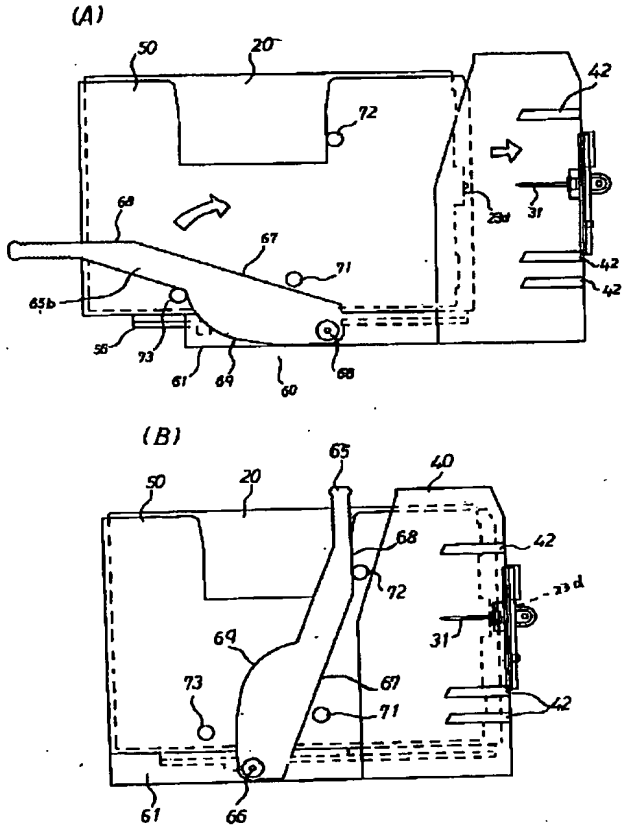
【図７】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